

Unknown

**45. The Commission seeks comment on what media types and devices (e.g., text, video) persons with disabilities will likely use to make an emergency call in an NG911 environment?**

NENA NG9-1-1 standards provide for two-way voice, video, line at a time text, and real time text.

**Can end-system SMS applications address some of the location- related issues, e.g., waiting to send an emergency SMS until location information has been acquired?**

We don't think such application behavior is needed.

**Have there been trials or operational experiences using SMS within the NG911 architecture?**

We are not aware of any

**Should SMS be considered primarily as a fall-back mechanism when voice communications are difficult or impossible to transmit?**

No. Many subscribers use SMS as a primary communications mechanism, and they expect 9-1-1 to use it. We think it should be a primary mechanisms. We agree that user education that voice and/or video communication is preferred over text, simply because 9-1-1 can get more information faster, and thus speed response, with voice and/or video than with text.

**As wireless systems evolve to IP based 4G architectures, can the reliability and features of SMS messaging be improved for the purposes of emergency communications and if so, how?**

NENA is supportive of the NOVES effort to provide message systems that are more reliable and more appropriate than SMS for emergency communications. As detailed above, as long as the application and user experience is the same as any other text service, the signaling mechanism could be different for 9-1-1. We have the usual concerns about mechanisms that are only used in emergencies, which tend not to work when you need them to. The existing E9-1-1 and NENA's NG9-1-1 systems do have mechanisms that are only used when calling 9-1-1, so having such differences for SMS does not concern us that much.

**43. We also seek comment on existing and future public expectations related to the use of SMS for emergency communications. Do consumers understand that currently available SMS generally does not support sending text messages to 911?**

NENA believes there are substantial number of subscribers who regularly use SMS that believe SMS to 9-1-1 works now, although we would judge that most of them realize it doesn't. We believe the overwhelming majority of "heavy" texters believe it ought to work.

**Could the implementation of NG911 lead to changes in consumer expectations and public misunderstandings about SMS capabilities?**

That would depend on how rollout of messaging services that do support 9-1-1 is handled. We think it will cause great difficulty, and response will be delayed in a significant number of cases if some messaging services support NG9-1-1 while others, particularly SMS, do not.

**Is there a need for programs to educate the public about the limitations of SMS for emergency communications, and if so, what entity should be responsible for developing such programs?**

Public education is vital, regardless of what happens on actual support of SMS to 9-1-1.

**Are there liability issues that could arise if consumers unsuccessfully attempt to use SMS for emergency communications?**

**For example, are there any proposed technical standards or approaches that would sufficiently address routing and location concerns? Further, will it be possible to use the existing short code system to reach PSAPs?**

There are several approaches that have been described for how to handle SMS in E9-1-1. Many of them require different user behavior, or substantial changes in how the 9-1-1 system works, in order to deploy. We describe here one possible mechanism, although any other mechanism that achieves similar results would be acceptable:

A conventional SMS gateway, directly connected to each SMSC could be configured to receive SMS messages directed to the “9-1-1” short code. The gateway could receive and send SMS messages to a “caller”. SMS messages include a cell id in the call signaling that can be used with the currently available databases to determine which PSAP should receive the (initial) message. The gateway could originate a voice call through the existing VoIP using TTY Baudot tones in E9-1-1, or a SIP MESSAGE in NG9-1-1 to get the text to the PSAP. The current wireless location mechanisms could straightforwardly be extended to allow the ALI query for E9-1-1 or the LIS query for NG9-1-1 to return the actual location of the texter. Proposed mechanisms for creating a pseudo session from a series of texts, using the address of the texter and a timer can be used to determine the beginning and end of the session. The user sees a normal SMS conversation. The PSAP sees either a TTY call, correctly routed, with good location on an ALI rebid, or a SIP message pseudo session, with normal NG9-1-1 routing and location. The operator has to deploy the gateway, connect it to the VoIP E9-1-1 system or the NG9-1-1 system as appropriate, and extend the current wireless location mechanism to allow location queries to the SMS device. While this would not be very inexpensive, it would not be onerous. No changes to PSAPs would be required, although training of call takers would be needed.

**Are there measurement results for mobile-to-fixed messaging that indicate the reliability and delay of SMS delivery under specified circumstances?**

NENA is not aware of any. However, we have seen statistics that describe circumstances that aren’t similar to how we envision SMS to 9-1-1 would work. We would like to see statistics of the reliability and delay of SMS when directed to or from a high volume SMS gateway connected directly to the SMSC.

**Would it be possible to add location information to SMS messages to help in routing such messages and, if so, how?**

Routing of a wireless call is usually done on the cell id. The same cell id is available to an SMS gateway. Therefore routing, in either an E9-1-1 system or an NG9-1-1 system would be the same as a voice call.

**Would it be possible to maintain session continuity across messages, e.g., at the gateway between the cellular network and the IP network?**

A proposal in the IETF describes a mechanism using the address (e.g. telephone number) of a texter and a timer to create a pseudo session, which is used to determine session start/end. This is needed to make sure all texts for a given incident are sent to the right PSAP. Call transfer issues are straightforward for both E9-1-1 and NG9-1-1 systems.

We do think data is very valuable, and would encourage all PSAPs to support the current NENA standards with regard to data.

At this time, we believe requiring PSAPs to support email or social network status pages is unwise.

**If secondary non-conversational media include the capability to transmit sensitive personal data, what privacy protection concerns are raised and how should they be addressed?**

NENA believes there are very serious privacy considerations on the handling of personal data. We think such data should be strictly opt-in. The caller should be free to select any party it wishes to hold their data. The NENA security mechanisms that control who can see what data are comprehensive, and we recommend them to the FCC as the way the owners of the data should control how it can be used.

**Would changes in current laws, regulations, tariffs, and overall policies be needed to enable NG911 to support these media types and system features?**

The mechanisms used in the NENA standards for carrying the URI in the signaling towards the PSAP require cooperation of the service provider. They need to accept the URI, either from their subscriber or their subscriber's designated holder of the data, and include the URI in the call signaling on a 9-1-1 call. Service providers may be unwilling to do this absent regulation, and will require relief from liability in handling the URI.

We encourage the FCC to mandate the use of the NENA mechanisms. It would not be acceptable for every supplier of personal data to define their own data formats, transport mechanisms and security mechanisms.

**42. Given these limitations, we seek comment on how the increasing use of SMS may impact emergency communications and whether NG911 networks should be configured to support SMS emergency communications.**

NENA differentiates between the current E9-1-1 system, transition to NG9-1-1, and fully NG9-1-1 deployments. This NOI addresses NG9-1-1, which we take to include transition, but exclude current E9-1-1. Our comments to this question are cast in that light.

Our comments with regard to SMS in full NG9-1-1 are detailed in the answers to questions raised in 33 above. NENA believes, contrary to industry claims, that if properly implemented, SMS to NG9-1-1 is practical, and if SMS remains in use for regular texting, in one way or another, we must support NG9-1-1 with at least the same applications, user interface and user behavior as SMS.

SMS can be straightforwardly interworked to SIP pager mode messaging, which is supported by PSAPs in the NENA standards.

We are concerned that transition will be lengthy, and origination network evolution to NOVES will be lagging. In that light, support of SMS, on at least an interim basis may be necessary.

While it would not be acceptable for every supplier of personal data to define their own data formats, transport mechanisms and security mechanisms, the outreach to stakeholders is still ongoing within NENA. This work in progress does not have any clear answers, yet.

**39. We also seek comment on the degree to which each of the media types discussed above will be used as a primary versus a secondary form of communication on NG911 networks.**

We agree that voice, video and/or text will be primary media as defined by the NOI. Any combination of media should be permitted in any call.

The FCC should be careful not to inhibit innovation or technology advances by requiring only certain media types.

**In some cases, primary media may not be available to a 911 caller (e.g., due to network congestion or end system limitations). In these cases, we seek comment on whether e-mail or social network status pages could possibly be used as the primary means of contacting a PSAP.**

The public needs to be educated on the acceptable ways to reach 9-1-1. 9-1-1 cannot afford to watch and monitor every social network site for potential 9-1-1 calls.

**Secondary media will likely include transmission of photos, live video, and sensor data (e.g., data acquired from sensors commonly found in mobile devices, vehicles, and medical monitoring systems). We envision a PSAP most frequently using secondary media to acquire supplemental information from a 911 caller or the caller's device.**

NENA agrees, and points out that its standards include mechanisms for one way sensor based alerts to 9-1-1. These mechanisms include ways for PSAPs to require credentials or permission being granted the sender prior to being allowed to send an alert. With an alert, the data is the primary "media".

**40. The Commission seeks comment on what primary and secondary media types PSAPs and service providers will likely support. Should individual PSAPs be able to choose the media types that they will support, or should all PSAPs be expected or required to support a specific set of media types?**

NENA standards require all NG9-1-1 PSAPs to support all forms of media, with at least a minimal set of codecs. We believe that is the only way to make sure that all callers, regardless of abilities or circumstances can get the help that they need. We do not believe that the costs, or the required training that would be needed to support all media is onerous, and we believe the benefits are substantial, especially to callers with disabilities.

**Should different standards or requirements apply to primary conversational media as opposed to secondary non-conversational media?**

We believe that support of data is not a requirement. Since we expect the range and quality of the data will evolve, it would be impractical to have regulations that cover it.

### **35.     *Still Images (Photos)***

It is extremely advantageous for PSAPs to be able to receive images from callers and bystanders. Unfortunately, in today's implementations, there is no way to take a picture and send it without disconnecting a call. It is essential that this limitation be removed. Present standards allow images to be included with a SIP message, but this is an uncommon mechanism in implementations.

The FCC should encourage the evolution of devices and services that would permit a photo to be taken and sent without taking down a voice/video call.

### **36.     *Real-Time Video***

NENA fully supports real time video in its standards, using SIP signaling and the H.264 codec. Interworking from other signaling standards such as H.232 is straightforward.

The FCC should require PSAPs to implement the NENA video standards.

The FCC should be careful not to inhibit innovation or technology advances by requiring only certain media types.

### **37.     *Telemetry Data***

NENA differentiates between telemetry data that accompanies a call (for example, vehicle telemetry data from an Onstar or Sync equipped vehicle when sent with an audio 9-1-1 call), and data that is sent without real time two way media. This differentiation is actually quite small; the SIP session signaling is used for the former, and a Common Alerting Protocol (CAP) message wrapped in a SIP MESSAGE transaction is used for the latter.

In many cases the data is not of immediate interest to the PSAP or call taker, but is of interest to the responder. But until the PSAP handles the call, there is no way to know who the responder will be; the PSAP makes that decision.

NENA technical standards provide mechanisms to retrieve the data, and send alerts containing the data to responders based on policy mechanisms controlled by the PSAP that gets the call. The information is passed to the responders, whether or not it is used by the PSAP.

The NENA standards include robust security mechanisms that allow the owner of the data to control who can see what data. This can be used when some or all of the data is particularly sensitive.

The FCC should mandate the use of the NENA mechanisms, and encourage the development of common schemas for classes of telemetry devices. It would not be acceptable for every supplier of telemetry data to define their own data formats, transport mechanisms and security mechanisms, which seems to be the direction telemetry providers are currently moving.

### **38.     *Auxiliary Medical and other Personal Data***

and local governments need several qualified applicants to choose from, not just one or two.

**32. We identify and discuss the most likely media types below, and seek comment on the potential for each of the media types to be supported in the development and deployment of NG911 networks. We also seek comment on whether there are any additional media types that we should consider for inclusion in NG911.**

Wide bandwidth audio codec should be encouraged with emergency calls. Background noise, and dictated information such as incident location is facilitated by higher quality audio, and can be a critical component for a call taker in trying to assess what is happening, and obtain accurate information from the caller.

The FCC should be careful not to inhibit innovation or technology advances by requiring only certain media types.

**33. *Message-Based Text***

NENA's technical standards require PSAPs to accept message based text using SIP signaling. There are a very large number of protocols in use for message based text, and it is impractical for PSAPs to accept all of them. NENA has chosen to require SIP signaling.

Understanding that SIP is not a dominant protocol for Instant Messaging, which is a subset of message based text. But SIP is used for all other signaling, and it is straightforward to interwork other signaling protocols to SIP.

No other protocols, as yet, have the enhancements needed to handle emergency text messages as SIP does.

Of great concern is the NOVES effort, which explicitly rules out the dominant SMS text messaging system as "inappropriate" for emergency texting, is that we will be faced with a situation where there are devices and services that permit emergency text messaging (NOVES compliant), but they are not the devices and services that consumers use for texting. This would be unacceptable.

Whatever services are made available to consumers for text messaging should be able to be used for emergency texting. It is unreasonable and not practical that the general public recognize that an emergency text needs a different application, or a different use model, than the messaging tool they use every day.

**34. *Real-Time Text***

PSAPs should accept RFC4103 real time text, the international standard for that media type.

substantial advantages in consistency and compatibility with the core functional elements discussed above.

These non-core elements include:

Legacy Network Gateway – the functional element that connects an unmodified legacy origination network (wireless, wireline or VoIP) to a NENA compliant NG9-1-1 system.

Legacy PSAP Gateway – the functional element that connects an unmodified legacy PSAP to NENA compliant NG9-1-1 system.

Logging Service – the functional element that provides a log history record of every significant event or media stream for all calls and incidents

Bridge – a conference mixing bridge that is used during call transfers

Interactive Media Response unit – a multimedia automated answering system – similar to an “IVR” - which can be used in some overload conditions (“Press 1 if you are reporting the car crash on I95, Press 2 for all other calls”).

### **How will these elements (both core and non-core) be affected by future technological change?**

NENA has endeavored to use the current best available technology underpinnings as the basis of its work, and as best as can determine, there are no widely available or cost effective technologies that provide any substantial advantages.

The 9-1-1 system has long been plagued by the inability to cope with the next thing (wireless, VoIP, texting, ...) and the very long and arduous path needed to get such services compatible with 9-1-1. One fundamental tenant of the NENA NG9-1-1 standards is that they seek to make connection to the system easy and inexpensive for an origination network.

The FCC should consider:

1. More standardization promotes vendor independence. The NENA NG9-1-1 standards are much more comprehensive than prior standards so that PSAPs and 9-1-1 Authorities can change vendors without significant data and procedural changes. However, it also implies a conformance to standards, especially data standards, by PSAPs and 9-1-1 Authorities so that vendor changes don't trigger such data and process changes. By adhering closely to comprehensive standards, the market tends to move to high volume, low cost, off the shelf solutions, rather than relatively higher cost, more customized solutions.
2. Regulations, especially at the state level, tend to inhibit vendor choice. Many state laws on 9-1-1 prohibit innovation and preclude adoption of NENA NG9-1-1 systems. The FCC should consider creating simpler, nationwide standards, or at least recommendations, on the qualifications required to operate NG9-1-1 infrastructure. State



**31. Are there core elements that should be part of every NG911 system and standardized across all NG911 deployments?**

NG9-1-1 is designed to work efficiently and effectively in disasters, and withstand deliberate attack on the nation's 9-1-1 system. The current E9-1-1 system cannot respond to overload conditions that either of these situations will cause.

In NENA's NG9-1-1, there are three core functional elements - the **Border Control Function (BCF)**, the **Emergency Call Routing Function (ECRF)**, and the **Emergency Services Routing Proxy (ESRP)** – that work together to effectively answer all calls. By making these core elements available to all PSAP's, a standardized interoperability of all PSAP's can effectively meet needs daily and in times of disasters or deliberate attack.

The three core functional elements, as defined by NENA standards - BCF, ECRF, ESRP, should be a part of every NG9-1-1 system.

In order for the PSAP's to make use of these three core elements, the interfaces must also meet NENA NG9-1-1 standards. These include not only the interfaces at the PSAP, but also these NENA defined standardized interfaces that will allow nationwide standardized access from the wireline, wireless, and other origination networks.

Today's E9-1-1 system is built on 30 year old technology that can no longer meet the need of today's interconnected, wireless, mobile society. Today in E9-1-1 wireline origination networks use static ALI for location data. There is one location (ALI) record per one 10 digit wireline phone number. For wireline and VoIP origination networks, the ALI does not contain the location information. Rather, a "pseudo ANI" (pANI) is used by the PSAP to query ALI. That query is "steered" to the origination network that presented the call to the 9-1-1 network, and the location is sent in the response.

With NENA's NG9-1-1 standards, the location is retrieved from a "Location Information Server (LIS)". The LIS supplies the location. The LIS is therefore also a required element.

The data in the LIS must be locations recognized by the 9-1-1 system and of sufficient quality to correctly dispatch responders. For civic (street address) forms of location, this involves a validation function. In NG9-1-1, there is a "Location Validation Function" that provides that service. One of the vexing problems in today's E9-1-1 system is the local variation for how location is encoded in the fields available in the ALI. Every community can choose to reinterpret how the fields are used, and there is wide variation. In order to have true interoperability nationwide, the NENA standards for these core elements must be adhered to.

To operate, these functional elements must exist on an IP network that conforms to the basic requirements for the Emergency Services IP Network (ESInet) that is also defined by NENA.

**Are there non-core elements that could be part of NG911 but are optional or can be varied locally?**

The NENA architecture provides several additional functional elements that may not be considered core functions, but if implemented according to the NENA standards, provide